CLAIMS

1. A rail manufacturing method, comprising:

a) hot-rolling a billet into a form of a rail having a high temperature;

b) after step (a), cooling the high-temperature rail is cooled to ambient temperature, wherein the rail is maintained in an upright position until a temperature of a surface of a foot of a rail reaches a temperature range of substantially 400 °C to 250 °C, and where the rail is cooled naturally without a use of at least one of an insulation and an accelerated cooling procedure.

2. The rail manufacturing method according to claim 1, wherein step (b) comprises, while mechanically restraining the foot of the rail and while at the same time maintaining the rail in the upright position, performing accelerated cooling of a head and the foot of the rail at a speed of substantially 1 °C per second to 20 °C per second, wherein the accelerated cooling is performed until one of (i) a surface temperature of at least the head reaches a temperature range of substantially 550 °C to 450 °C, and (ii) the surface temperature of the foot of the rail reaches a temperature range of substantially 500 °C to 450 °C.

3. The rail manufacturing method according to claim 2, wherein one of the surface temperature of the head of the rail which begins the accelerated cooling and the surface temperature of the foot part of the rail which begins the accelerated cooling is the temperature at which a structure of the rail is austenitic.

4. The rail manufacturing method according to claim 1, wherein, after step (a),

the rail is maintained in the upright position until an ambient temperature is reached.

5. The rail manufacturing method according to claim 4, wherein a cross-sectional shape of the rail is measured online during a conveyance of the rail that has been placed into the upright position after step (a).

6. The rail manufacturing method according to claim 1, wherein the length of the rail is between substantially 80 meters and 250 meters.

7. A rail manufacturing method, comprising:

a) hot-rolling a billet into a form of a rail having a high temperature;

b) after step (a), cooling the high-temperature rail is cooled to ambient temperature, wherein the rail is maintained in an upright position until a temperature of a surface of a foot of a rail reaches a temperature range of substantially 800 °C to 400 °C while the foot of the rail is mechanically restrained.

8. The rail manufacturing method according to claim 7, wherein step (b) comprises, while mechanically restraining the foot of the rail and while at the same time maintaining the rail in the upright position, performing accelerated cooling of a head and the foot of the rail at a speed of substantially 1 °C per second to 20 °C per second, wherein the accelerated cooling is performed until one of (i) a surface temperature of at least the head reaches a temperature range of substantially 550 °C to 450 °C, and (ii) the surface temperature of the foot of the rail reaches a temperature range of substantially 500 °C to 450 °C.

9. The rail manufacturing method according to claim 8, wherein one of the surface temperature of the head of the rail which begins the accelerated cooling and the surface temperature of the foot part of the rail which begins the accelerated cooling is the temperature at which a structure of the rail is austenitic.

10. The rail manufacturing method according to claim 7, wherein, after step (a), the rail is maintained in the upright position until an ambient temperature is reached.

11. The rail manufacturing method according to claim 10, wherein a cross-sectional shape of the rail is measured online during a conveyance of the rail that has been placed into the upright position after step (a).

12. The rail manufacturing method according to claim 11, wherein the length of the rail is between substantially 80 meters and 250 meters.